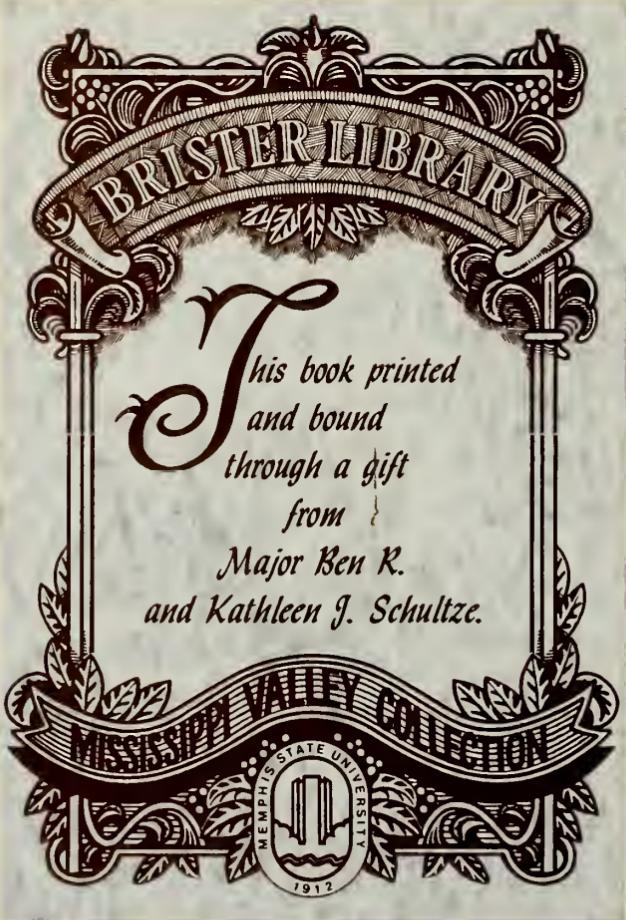


ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY
INTERVIEW WITH
LLEWELLYN EVANS

BY - CHARLES W. CRAWFORD
ORAL HISTORY RESEARCH OFFICE
MEMPHIS STATE UNIVERSITY



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ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY

INTERVIEW WITH LLEWELLYN EVANS

DECEMBER 26, 1969

BY CHARLES W. CRAWFORD

ORAL HISTORY RESEARCH OFFICE

MEMPHIS STATE UNIVERSITY

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ORAL HISTORY RESEARCH OFFICE

I hereby release all right, title, or interest in and to all of my tape-recorded memoirs to the Mississippi Valley Archives of the John Willard Brister Library of Memphis State University and declare that they may be used without any restriction whatsoever and may be copyrighted and published by the said Archives, which also may assign said copyright and publication rights to serious research scholars.

PLACE Chattanooga, Tenn.

DATE Dec. 26, 1968.

Llewellyn Evans
(Interviewee)

Charles W. Crawford
(For the Mississippi Valley Archives
of the John Willard Brister Library
of Memphis State University)

THIS IS MEMPHIS STATE UNIVERSITY ORAL HISTORY RESEARCH OFFICE PROJECT,
AN ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY. THE DATE IS
DECEMBER 26, 1969. THE PLACE IS CHATTANOOGA, TENNESSEE, AND THE INTER-
VIEW IS WITH MR. LLEWELLYN EVANS, FORMERLY WITH THE TENNESSEE VALLEY
AUTHORITY. THE INTERVIEWER IS DR. CHARLES W. CRAWFORD.

DR. CRAWFORD: Mr. Evans, I suggest that we start by getting something of
your early life, your education, your experience in Tacoma, and your
early contact with TVA. Then, if you will you might outline your TVA
experience. We'll ask some questions and discuss it further.

MR. EVANS: This interview is taking place on Missionary Ridge at 68 South
Crest in front of a fireplace on a snowy day. We are about to outline
what Mr. Evans did to qualify to be a TVA engineer and how he was re-
cruited. Mr. Evans professional career started at Berkeley, California
as a graduate of the University of California Engineering School there,
largely electrical engineering. He had worked his way through college
as an electrical wireman. He made a good living for himself while he
was at college by working at the trade which he had learned before he went
to college. When the San Francisco earthquake occurred and the workmen were
paid fabulous sums, why, he didn't have to work long to get all the money
he needed for college. When he got back to Tacoma he formed a partnership
with one of his classmates--D. T. Dickson, and ran an electrical contract-
ing business doing post offices and apartment house buildings and office
buidlings, and all sorts of electrical wiring that was needed all through-
out the Pacific Northwest, as far east as Montana, and as far south as
Portland. But Tacoma, Washington was headquarters.

His family lived at Tacoma, and that was the convenient head-
quarters. During the time he was working for himself, the City of Tacoma

MR. EVANS: needed an engineer to head up their electric power business. They (Cont'd.) had some difficulties that needed straightening out and a foundation laid for a good business way of running the municipal plant instead of the political way that it had been operated. So, because of personal friendship for the Commissioner, Mr. Evans moved over from a private business to the superintendent of lighting for the City of Tacoma. During his operation there, were operating one hydro plant, and we built two others, and two steam plants. Then comes the TVA Act that required a full complement of new people to implement it. Arthur Morgan, who was made the Chairman of the Board and the moving spirit of the TVA, was out recruiting these men and came to Tacoma and we had an interview in an automobile driving from Seattle to Tacoma, and then he came to dinner with the Evanses' on the patio over-looking the bay at Tacoma, and enjoyed our strawberries and other good food. He departed for Knoxville. It wasn't long afterwards we got a telegram wanting to know if we would come to TVA and stay three weeks and help them get a foundation. With the consent of the City Council, Mr. Evans made the trip.

In Washington he met not only with Dr. Arthur Morgan, but also with Mr. Harcourt Morgan and later on with Mr. David Lilienthal. Mr. Lilienthal was about that time assigned to the power duties of the TVA, and he looked me over pretty carefully. I remember one scene that really is fundamental to the whole TVA concept. We went into a back room of the little hotel in Florence, Alabama with two or three of the Senators and Mr. Lilienthal introduced me to the folks. There was plenty of smoke, and I wasn't even sure who they all were, but I did know Senator Rankin. Well, they wanted to know how you did it out West. How did you get contact with your people? I told them a story of Ochap Valley Co-op.

MR. EVANS: How the City of Tacoma was by law not permitted to sell any power (Cont'd.)

outside the city limits. But our transmission lines to the power plant thirty miles from the town went right over a prosperous valley that needed power very badly. This Ohap Valley bunch of farmers just kept asking and were very persistent in demanding power. If they could get it from the transmission line that was going by, why couldn't they have some power?

So, I met with them out at the little red school house, and there were about fifty of them in there. I said, "Now, we can't sell you power like we do the customers in Tacoma, but if you build a power line over to the power house, which isn't very far from here, about five miles, why, you can get it there at the switchboard. Here's the way to do it. Some of you haven't got much money. You dig the holes, and you fellows that have got a farm with a wood lot, you cut the poles, and you fellows with the money in the bank, you buy the wire. And maybe we can get electricity for you down there by that method." Well, old Togger Peterson, he was the leader of the bunch, gets up. He said, "Boys, put your money on the barrel." And the barrel was provided, and each of them put their money on the barrel except a straggling few who had to borrow or in some way make up their part. And, you know, they went out the next day, even, and started work. And they got that line going.

Well, sir, this story just tickled those fellows about the grass-roots belt, you know. Then the questions started in. We said, "Well, we can form co-ops right here. These Southern farmers always keep enough money in their overalls to buy a span of mules, and why can't we do that right here?"

From there on they took the ball, and when money wasn't available, we had the R. E. A. We helped to organize the R. E. A. to furnish the money.

MR. EVANS: From then one we formed almost a hundred co-ops, to distribute the (Cont'd.) power. Then the farmers came in and paid their part, each one. If he didn't pay it to start with, he paid a higher bill until his part was paid.

DR. CRAWFORD: In what state did you form those co-ops?

MR. EVANS: In the State of Washington. The State of Washington, not far from Tacoma, Washington. Tacoma, Washington had the lowest rates in America, and they had the general form of the Ontario Public Plant, which had what is known as an encouragement rate. After you've used enough to pay the minimum, you can have it cheaply from then on. Well, so Tacoma not only had this low rate, but they had their bills paid and they had their bonds paid; they had everything paid. It showed them that the business paid. If we could make a go of it, why couldn't we do something like that down in the Tennessee Valley? That's the thing they wanted me down there for.

DR. CRAWFORD: Where did these co-ops in Washington get their engineering advice?

MR. EVANS: Well, largely from private concerns that were doing business there, or they would come up to the city to get the simple requirements of those first simple lines. They could talk to any lineman, almost, and get what they needed to know, because the city plant furnished the transformers and engineering sub-stations. When it got to a point where they went into it heavy, of course, they had to own the sub-stations, just as they do here in the Tennessee Valley now. They have a very complete engineering organization at each of the present co-ops. The fact is they got to be pretty big power companies. I noticed one of them in Nashville is being sued to give back to the customers some of the money they had falling out of their ears.

Well, so we looked over the situation back and forth, and in a few weeks, the three weeks that I had been loaned to the TVA was about up.

MR. EVANS: I got an extension for three months. During that three months (Cont'd.)

Mr. Lilienthal wanted to know if I wouldn't go on the staff. It came along to the deadline when I had to decide, and I was driving from Knoxville to Muscle Shoals down across country, and I went through Lincoln County. Now, Lincoln County was one of the lowest income counties of Tennessee, at that time. Well, sir, I rounded a corner and I came by a little old grist mill and turned up the road. There was a woman with a baby in one arm and packing a bucket of water in the other. She was having a hard time. Before I got down to the Shoals, I said, "I think we can do something about this." I told Lilienthal that I would stay.

DR. CRAWFORD: How did you make that decision? When was that?

MR. EVANS: Well, that would be in July of '33, or thereabouts. It was early in the history of TVA. When I first came I went down to Washington and we did quite a few master studies and then went to Muscle Shoals. The first thing we did at Muscle Shoals was to take over the power plant from the Army. The Army captain started in to show me around. One of the things that was very close to his heart was malaria control. They had a very tough bout with malaria, and the drugstores all sold some kind of medicine or something to get over the malaria effects which made the people lazy and drowsy and sometimes awful sick. Waves would come, and then it would go. Well, the Army had spent about 300,000 dollars a year on keeping the mosquitos down that caused the malaria, and he was afraid that TVA would run off and let that go, you see? So he took me in a boat and we went up the reservoir, oh, ten or twenty miles onto an island. This island was covered with jungle brush, and there on the porch of a cabin was a fellow sitting, and he was sitting pretty quiet. He was yellow as yellow could be. Oh, boy. We didn't go too close to that porch.

MR. EVANS: Captain Riley said, "Now, that fellow's got malaria and no food."
(Cont'd.)

Then he took me to the station on shore down a ways, less than a mile from him, you see. Here was an arrangement for catching mosquitos, whereby they would catch these mosquitos and see if they were deadly. Anophales mosquitos. Then he impressed me in other ways that their program really cost money, and that they had to spray to keep down these mosquitos; they had to keep the brush away from the shore; they had to keep the undergrowth out of the way; they had to do various clean-ups along the shore to stop these mosquitos from breeding. It was pretty deadly stuff. Before I had been there three months, I had a little dose of it myself.

Well, anyhow, we took over the power house from the Army, and it was not in shape for commercial use. That is, it could be run on a schedule for a certain purpose and then shut down, but to never fail and be sure that you're going to have required power night and day in required quantities, we had to get ready, and we started that getting ready. We were also building a new dam up at Norris, which was 200 miles away, and a second dam above Wilson Dam at Wheeler. Well, these projects needed some kind of tie, and we also were being besieged with people who wanted to go to work. One of the first things we tackled then, was to build a transmission line all the way from Muscle Shoals up to Norris in Tennessee--northern Tennessee--200 miles. We established an office of engineers and accountants and lawyers and real estate men to purchase right of ways. Right there in the Army's old buildings we did this. We took up quarters, some of us temporarily, in what was known as first quarters, where the Army officers had their headquarters.

To build this transmission line and to buy the right of way required some very quick surveying. I went into Washington and arranged for

MR. EVANS: aeroplane mapping, which at that time was very new, but they had
(Cont'd.)

developed it during the war. We got hold of a private concern that would fly our line. We went out and put markers at the turn points on this line-- big sheets that covered, oh, 100 feet long, so that we could see them from the air. I flew with the pilot, and we took those pictures. Then we made our own stereo rig, so that you could see in relief the height of all the buildings. By this method we were able to see a grave yard up ahead and turn the line just enough to miss the grave yard or the reservoir or the obstruction. Our right of way men could go into the field without having ever been on the land. The next principle we established was when we bought right of way, we let the farmer that sold the right of way keep the land and cultivate it; just give us a place to put the tower. We also made a bargain with him to do the clearing himself. We would pay him cash right then. So he got paid for his land and got paid for his clearing, and we put money in their pockets almost before our men had left their place. That principle is still good with TVA.

DR. CRAWFORD: Was that well-accepted? Did you have opposition from any of the public?

MR. EVANS: Practically none. We didn't have a law suit on that whole 200 miles, as I remember it. Unless it was a case of absentees or something like that. If you could make a deal with a man, then there you are. So we did that transmission line, and as I told you, TVA didn't have an awful lot of engineers accumulated as yet. There were a lot of cases where the electrical engineering folks had to help out with the work that was going on on the foundation work at Norris and Wheeler. I had a chance on the inspection and the go-ahead on those foundations. I remember riding a boatswain chair down a hundred

MR. EVANS: feet or so in the Wheeler Dam foundation and watching whether or not (Cont'd.)

our grouting process had sealed all the cracks. I got to one place where a squirt came out and wet me plenty. So it wasn't filled. The thing was to bore a hole here and another one ten feet away, and make an alternate row of them. Between the two of them, one hole or the other would furnish the necessary grouting pressure to fill all the cracks. We had to do a lot of work like dental work, as we called it. We would find some kind of clay in a section between rocks, and there was nothing to do but to take it out. You would dig it out like you would dig out a bad place in the teeth and fill it up with concrete. We had a board of experts--ten or twelve fellows--that had to pass on these foundations before they got through.

DR. CRAWFORD: How was the Board appointed? Who selected them?

MR. EVANS: Oh, in those early days, Arthur Morgan, of course. He and his assistant did the trick.

DR. CRAWFORD: Were they local people?

MR. EVANS: Yes. Well, the first line that we built to serve people was out of Muscle Shoals down toward Waterloo, oh, maybe twenty miles or so. This farmer's line was built by our engineers with the same regard to strength and number of poles and distance apart and height that we used on our big transmission lines. What we did proved to be a radical change compared with the way that rural electrification was done before. Because rural electrification as it was done in those days was nothing more than an extension of a city line, with each pole 125 feet from the next pole, and the cross arms the same size and all the standard things that were available were put into a line going out to a farm group. The cost was in the order, oh, from 1500 to 2,000 a mile. Well, by building it the way we built these first lines, we sometimes could set poles

MR. EVANS: 600 feet apart, and we could jump from one hill to another and go (Cont'd.)

a thousand feet if we wanted to. And, instead of having cross arms, we put a high tension wire on the top pin and a low neutral grounded wire down below, and that was all that was necessary to get out to many of these farmers. That cost 600 dollars a mile. There was quite a difference.

Well, it was all very well to do that on one line, but how are you going to buy the hardware and the transformers and the things that go into it when they have to be tailor-made for that kind of a business? So we co-operated with the Georgia Power Company and the Alabama Power Company in establishing a standard. We built the manual about an inch thick, with every piece of hardware drawn in there and every arrangement of poles and guy wires and so on. So every manufacture could start in business making line parts that would be acceptable, which cut the cost tremendously.

DR. CRAWFORD: When did you make that agreement with the Alabama Power Company and the Georgia Power Company?

MR. EVANS: It wasn't any agreement, we just made it, possibly, by telephone.

DR. CRAWFORD: Were you able to co-operate with them? I think usually they had some opposition from the private power companies.

MR. EVANS: Well, yes, and that brings in the matter of our negotiations for how we were going to get along with each other in the same place. We found that the Georgia Power Company had a good deal of the same ideas that we had about this rural electrification and expanding the systems into the country. They also had the same idea of selling power at an encouragement rate of some kind. So, the Alabama Power Company was slowly coming to the same thing. The Mississippi Power Company was, too, but they were all under Wilkie.

MR. EVANS: Wilkie was negotiator on their side all through the thing.
(Cont'd.)

After we got this set of standards built, there came the matter of how to put in meters. At that time meters were put inside the house or in the basement or out on the porch or someplace. We established an outdoor meter where the meter reader could read it and where it would be weather-proof. We made a standard for the kind of box that was to go in so that all the manufacturers would make the same thing and they would be cheaper that way. Instead of paying four or five dollars for a steel box, you had one for \$.79, because you had established a standard. Well, one of the important things on any country line was a transformer. A transformer ordinarily has two primary insulators that are expensive and two secondary insulators. We organized an arrangement with the Maloney Electric Company out in St. Louis to make a transformer to suit our specifications that had only one high-tension insulator and a grounded case and so on so that it was really nothing more than a throw-away device after you got through with it. It was a tin-can with two insulators in it.

Well, they standardized that and sold millions of them. The other companies all went the same standard, of course.

This matter of who was going to get the materials business came up about that time. You see, we were building this transmission line of two hundred miles and it was a big bunch of money for the conductors and the poles and steel frames and the things that had to be purchased. At that time we hired two engineers for steel fabrication. We hired two engineers to design transmission lines. Our little office began to get bigger and bigger down at Muscle Shoals. Then it came time to buy the big transformers to supply the lines. I remember that I made a trip to Pittsfield, Massachusetts. It was the home of

MR. EVANS: the General Electric Company. And the streets of Pittsfield were (Cont'd.)

grass-grown. There was nothing going on up there. It was a hard-times period, you know.

DR. CRAWFORD: This was early in the thirties?

MR. EVANS: Yes. Well, they had put their bid in in such a way that certain details had to be straightened out before we could give them the go-ahead. After we had straightened them out in their hotel, everything was all right. The newspapers the next morning had double type clear across the page that the General Electric Company had the transformer and they were going to start the shops. So TVA began to spread into more than just down South. There was no give-away to down South. But that was one of the most striking examples of how the money spent on TVA was really spent all over the nation and elsewhere.

DR. CRAWFORD: Who designed the specifications for these small lines in TVA territory? Did you do that?

MR. EVANS: Well, we designed them in those early days, yes. We established the standards which were used in the engineering for all of the farm lines, and the big engineering of the transmission lines. Yes, I personally did a good deal of the first transmission lines, which had the finest record for lightening protection. We never had any outages from lightening. That line was published in the technical magazines. The article was by myself and Mr. A. C. Daniels. He was one of our electrical engineers. He is working now at Tullahoma on the air tunnels--wind tunnels.

We built this line half way to Norris with wood poles, and in the rest of the half we got into the mountainous districts, we built with steel poles. Steel poles and steel towers. We jumped great distances with those towers. We had spans up to three thousand feet in getting off the mountains.

DR. CRAWFORD: Was that why you used the steel in them--the mountains?

MR. EVANS: Yes, because of the long spans. That was economical, and we wanted to spread the business, too. Because I came from the northwest, they didn't like the idea of my buying all the cedar poles from the state of Washington. But that was the time that if they could buy them now for the price we bought those poles they would sure be happy.

DR. CRAWFORD: Mr. Evans, what happened then, about setting the TVA rates? How did you do that?

MR. EVANS: It wasn't long after we had taken over the plant from the Army until the City of Florence and the City of Tupelo, in Mississippi, kept knocking at the door to get some power. Well, they wanted to know how much we were going to charge for it. Florence, being right at the back door there wanted a special rate. They said, "You won't have to transmit this or anything. We want a special rate." So that required looking into the matter of rate schedules. Mr. Lilienthal wrote me a letter and said, "Now, kind of give me a run-down on what it's going to cost for power and what we can sell it for." Having had some experience in Tacoma in the matter of making ends meet with the low rates, I sent him a letter and said, "This is my first report." I told him about how we could get it lined up. They thought I was going too low. So he came down and we went over the figures. I showed him how I had done the thing so that we would get about twenty percent more to start with than the City of Tacoma was getting, and that the province of Ontario was getting. I said I thought we could meet it. Well, of course, we couldn't do a thing like that on one man's word, so we went down to New York and Mr. Lilienthal had a Columbia professor down there that he had a lot of confidence in. We cornered him on the matter, and then Mr. Lilienthal had a lot of professor friends up in Madison, Wisconsin that he had a lot of confidence in.

MR. EVANS: Then he said, "Oh, let's go up to Wisconsin and talk this over."
(Cont'd.)

So we went to a little cabin on the lakeshore on the campus of the University of Wisconsin.

DR. CRAWFORD: In Madison?

MR. EVANS: In Madison, yes. There were six of us. Oh, we spent a day and a night up there going over the matter and came up with something just about like I had. But we had some features that were different and unusual from any rate. For instance, in the resident rate, we had arranged so that after a man had bought enough to pay for the metering and billing, he immediately got a reduction in rate, and then, after he had bought enough to take care of his electric range and cooking and household use, he got another reduction. For, if a factory could buy power at a low rate, why shouldn't a fellow in a residence have the power just as cheap after he had paid for all these fixed charges that even the small customer has to pay for anyway. Why shouldn't he have it? So, we put that in. Well, that didn't look quite right. We had to have an end. There was a young fellow named Falk in the program, and he was a New Yorker that knew something about stock margins. What is this stock market scheme of buying where you protect yourself? Well, anyway, he had the stock market sense, and he said, "Now, let's tell these fellows that they can have, oh, a thousand kilowatt hours at that unusual low factory rate, but let's after that, let them pay the average of all steps. Well, we looked at that, and it looked all right. That's one way to do. We adopted that. So there is a saving clause in the TVA's rate to residents whereby after the resident has used up all of the power that he needs for lights and he needs for his range and he needs for his electric heating, he comes up to an average price that he paid for all in the first block. That has proved to be a very fair situation.

DR. CRAWFORD: Was that Mr. Falk's plan?

MR. EVANS: Oh, not the whole thing, but the idea of coming back up again was.

I think he can be credited for that, because in the Tacoma rates we didn't have that. We didn't need it, and I don't know that TVA needs it, but there you are.

Well, the matter of the power rates for the special customer right at the Shoals was pretty touchy, and we did allow ten percent, I believe, for the first contract that we let in Muscle Shoals. But the next contract that we let in Tupelo contained the full power schedule and is still in force for TVA.

DR. CRAWFORD: Did you make the Florence contract before the Tupelo contract?

MR. EVANS: No, I don't think so. I think they were all signed together. The Board had to act on the matter of those contracts in negotiating them.

DR. CRAWFORD: Did you have enough time to get this planned, or were you rushed?

MR. EVANS: No, the matter of getting the rates ready, we didn't have a customer for a few months after they were ready. I think that we were quite orderly in the way of getting things started there. Of course, our outlet, our customers, were the next thing that we had to consider. If we went down to Tupelo, that was a ninety-mile line to build, or something like that. The question would be if whether that line would pay. We surveyed the line and never built it, because we worked out a scheme to buy the few lines that the Mississippi Power Company had up in that section, and then we got power down to that country with some very short additions. But later, that same line has been built, here not very long ago. That's been twenty or thirty years before using that old right of way.

DR. CRAWFORD: I see.

MR. EVANS: This matter of rates took us up to Washington and up to New York a good many times, and then comes the matter of purchasing the power companies rather than paralleling the lines that they had already built. That seemed like a big waste to do that. The power companies had pioneered the place and deserved compensation. Not that they hadn't had some already from the customers, but they had expectations that they were entitled to. I remember one of the first trips that I made with Mr. Lilienthal. We went to the hotel in New York and Wilkie came down and met with us, and he asked point blank, "Now, how much do you want of this system of ours?" He wanted to get our outside idea. Well, we didn't have a very big idea of a big territory at that time.

DR. CRAWFORD: When was that, sir?

MR. EVANS: Oh, that was in '33. Or early '34, anyway.

DR. CRAWFORD: Where did you stay in New York then?

MR. EVANS: It was the Roosevelt Hotel. At that time it was a very good hotel. I guess it's kind of exclusive to this day.

DR. CRAWFORD: Did you have the meeting arranged with Wilkie, or did he just happen to come by?

MR. EVANS: Oh, no, it was arranged. We had appointments very carefully arranged. He had his people, and Dave had his people. I guess it was Dave and I, and he had one man. It was two and two.

DR. CRAWFORD: What was your view of TVA's territory then?

MR. EVANS: Well, we had started this transmission line, and we just drew a circle around Muscle Shoals and a circle around the other one. It was about like that. That's all we set at the time. In other words, we at that time didn't have the idea of going to the industrial center of Chattanooga and Knoxville. Those things cropped up later. But we did need an outlet for the power that we were



MR. EVANS: generating and the power that we expected to be generating from those
(Cont'd.)
two dams.

DR. CRAWFORD: How did you expect to sell that power? Did you expect to sell it
to the private power companies, or to co-operatives?

MR. EVANS: Well, we expected to sell both ways. We were at that time in a
contract with the Alabama Power Company to deliver power when we didn't need
it and when they did need it. That was an optional contract of surplus power.
We still have ties with the Alabama Power Company. In fact, we have ties with
every power company that borders around the TVA. Because everybody wins
on those.

I remember the first transmission line that we built between the
City of Tacoma and the City of Seattle, in the State of Washington. You know,
those are two rival cities, and at that time each was trying to be the biggest.
Neither one of them would admit that they needed anything from the other.
For the City of Tacoma to buy anything from Seattle or Seattle to buy anything
from Tacoma, oh, no. Well, J. D. Ross and I talked on the phone about the
matter. I said, "Well, Mr. Ross, everybody is going to win on this matter.
You can't possibly lose. What you sell is something that would go over the
dam. What we sell is what would go over the dam." He said, "You're right.
I'm for it." We built a transmission line between us, and that was the first
one, as far as I know, between the rivals. But that was evident that
everybody wins on an inter-tie, because it cuts down the reserves that each
has to have, and it gets rid of the surplus that each has.

DR. CRAWFORD: You had learned that lesson in Tacoma, hadn't you?

MR. EVANS: Yes, oh yes.

DR. CRAWFORD: Why did Arthur Morgan turn to Tacoma to get your assistance at the beginning of TVA?

MR. EVANS: Well, I don't know. At that time J. D. Ross was with one of the investment commissioners for the government in Washington. I think he talked with Ross in Washington and went out to see him about getting somebody at Seattle. Because I know at the time I met Morgan out there, he was in Seattle, and he was trying to get my people in Tacoma, and I got word while I was in Seattle that they wanted to see me. I picked up A. E. Morgan in Seattle and we drove to Tacoma. That was the accidental meeting. I don't know how he happened to come out, but he did know that we were a strong municipal plant out there. There was another one in Jacksonville--Jacksonville, Florida. They don't pay any taxes down there, because the plant pays for it.

DR. CRAWFORD: Did you know Dr. Morgan before that meeting?

MR. EVANS: No. I didn't know any one of the directors. I didn't know any one of the directors and very few of the engineers.

I did know the representatives of the General Electric and the Westinghouse Company and the different wire companies because they had been doing business with me out in Tacoma. I was well-acquainted with them. I was also well-acquainted with some of the big-load people--the Hooker Company chemical people, because they've got power out at Tacoma.

DR. CRAWFORD: Did you do any work recruiting staff members--engineers--for TVA?

MR. EVANS: Yes, there was one engineer in particular that we needed at Muscle Shoals. We had this big chemical plant that was going to make fertilizer. It was going to make fertilizer either with some kind of a blast furnace or with an electric furnace, whichever was the cheapest. After experimentation and

MR. EVANS: research with the blast furnaces, we decided to use the electric.
(Cont'd.)

There were already on hand small transformers and small furnaces for the electric process. But these furnaces were not suitable for phosphorus. They were intended for something else. So those furnaces had to be re-designed and made suitable and operative for making phosphate fertilizer. Well, at Tacoma, Washington we had a Ferro-Magnize plant, and we had a boy named Roy Heaton, who was the head engineer of that plant. During the depression their business in making glass-wool insulation fell off just like every other business. I suspected that Roy would be available, and so Roy was one of the men that I recruited. I recruited Falk. I recruited a whole series of them who we needed from time to time.

DR. CRAWFORD: You seem to have built up a very efficient group of engineers.

Why were you able to get the people that you wanted?

MR. EVANS: Well, TVA in general was very fortunate in being able to recruit the best engineers and the best economists and so on because it was during the depression, and those men were footloose, even if they were working. My right-hand-man, George, was working for Westinghouse. But they had cut him down to so many days a week and so small a paycheck that he was willing to come. That was the situation that we took advantage of, and we just got a world of wonderful men. Of course, TVA's screening method was good, too. I'll tell you, our personnel department, when it started in, was one of the first personnel departments that really knew how to go down the line and do a job. They had, oh, 400,000 applications. You can imagine about what they had to choose from.

DR. CRAWFORD: Who did this personnel work at first? Was that Floyd Reeves?

MR. EVANS: As far as I know, Reeves and the man that you're going to see down in Florida.

DR. CRAWFORD: Draper?

MR. EVANS: Draper, had a hand, not first hand, in directing that. Mr. Morgan was no fool on that thing, because he had gone through it in the Miami Conservation District up in Ohio, you know. The flood control district up there, and had done the recruiting and the engineering on that. He had an embryo group all ready to go ahead. His mapping man, Ned Safford that he got lived in Memphis, and was a fine man. He did a wonderful job recruiting map men. He went right ahead with this aerial mapping so as to get work done quickly, just as I had done with the first transmission line. He went right ahead and used the aerial maps. That came in pretty useful during the war. That mapping department was so strong and so ready and so well-equipped that they got to making maps of all of this war work. When I was in China I used their maps that they had made of the Coast of China and the inlands of China, they were flown over, why, we could have pin-pointed the street corners and everything. Nothing can beat an aerial survey when it's done with the right equipment, and the maps show the actual physical conditions.

DR. CRAWFORD: Were you able to get the equipment that you wanted in TVA?

Did you ever have shortages of equipment that you needed?

MR. EVANS: Well, quite a lot of the things that we used were invented, you know. For instance, when we wanted a stereo rig to use in viewing our photography of a transmission line, we didn't have a stereo rig; we had to make it, and make it on the spot. We did that, but most everything was available, and everybody anxious to sell.

1. The first part of the paper is devoted to a general discussion of the problem.

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MR. EVANS: You know, when it came to buying the transmission line conductors, (Cont'd.)

we had an interesting contest. Of course, the copper people wanted to sell copper, and the aluminum people wanted to sell aluminum. The copper people told us how aluminum was too light and it would stretch and it would fray and it would. . . Everything would go wrong with it. The aluminum people would say, "Well, the copper costs a little too much, and you will have to have more poles." The aluminum people took me to their Alcoa yard, and they took me through the gates of the stockyard. Here in cords, just like cord wood, were the bars of aluminum, as far as you could see. They said, "We need to sell aluminum." Well, when the bids came in, they were 25% low. Of course, the copper people had to do an awful job of selling then, to beat 25%. It just happened that I had built 25 miles of transmission line out of Tacoma using aluminum and I knew all about it. So I bought aluminum, and we've been buying aluminum ever since, and saved 25% over copper, except for certain things.

Copper has its place, uniquely, in certain kinds of transmission lines. I know I was severely criticized for not distributing the business. In a few years after we had been buying so much aluminum, I had to make a report. When I got through tabulating what it would have cost in copper compared with the five years of purchase of aluminum, everybody was satisfied.

DR. CRAWFORD: Your experience in Tacoma helped you a great deal in this, didn't it?

MR. EVANS: Oh, yes. You see, I was quite an old-timer. I had already built and had to do with a lot of building. Of course, one engineer doesn't build a whole thing by himself. These plants were all built by teamwork. I was in on most of the teams, and I was in on the big decisions. That's what really counts. You've got to start right. You've got to have a foundation and set up the principles that you are going to use. We always had good construction

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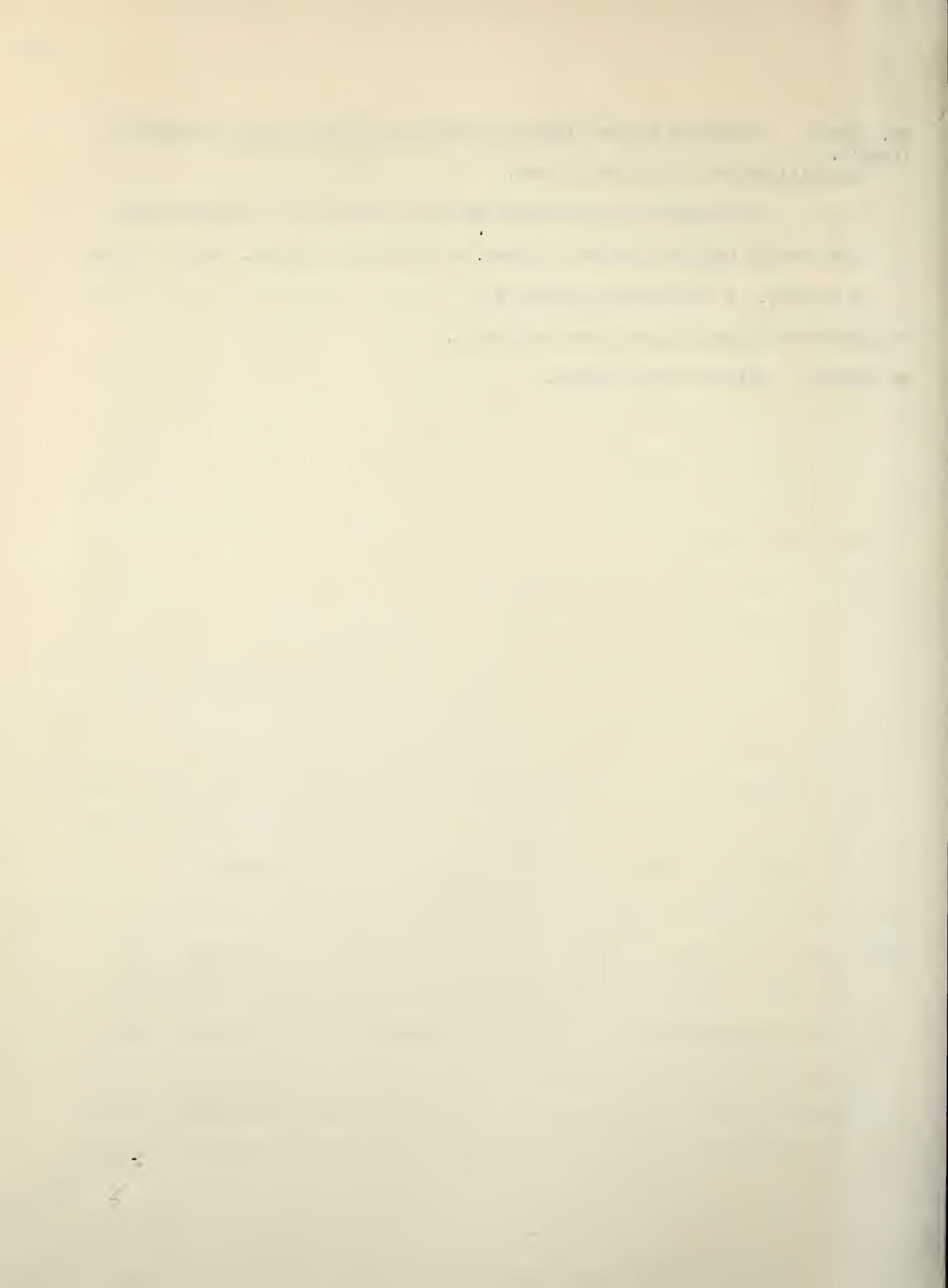
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MR. EVANS: schedules and we always had deadlines to meet, and we wanted the
(Cont'd.) material and the men to do it with.

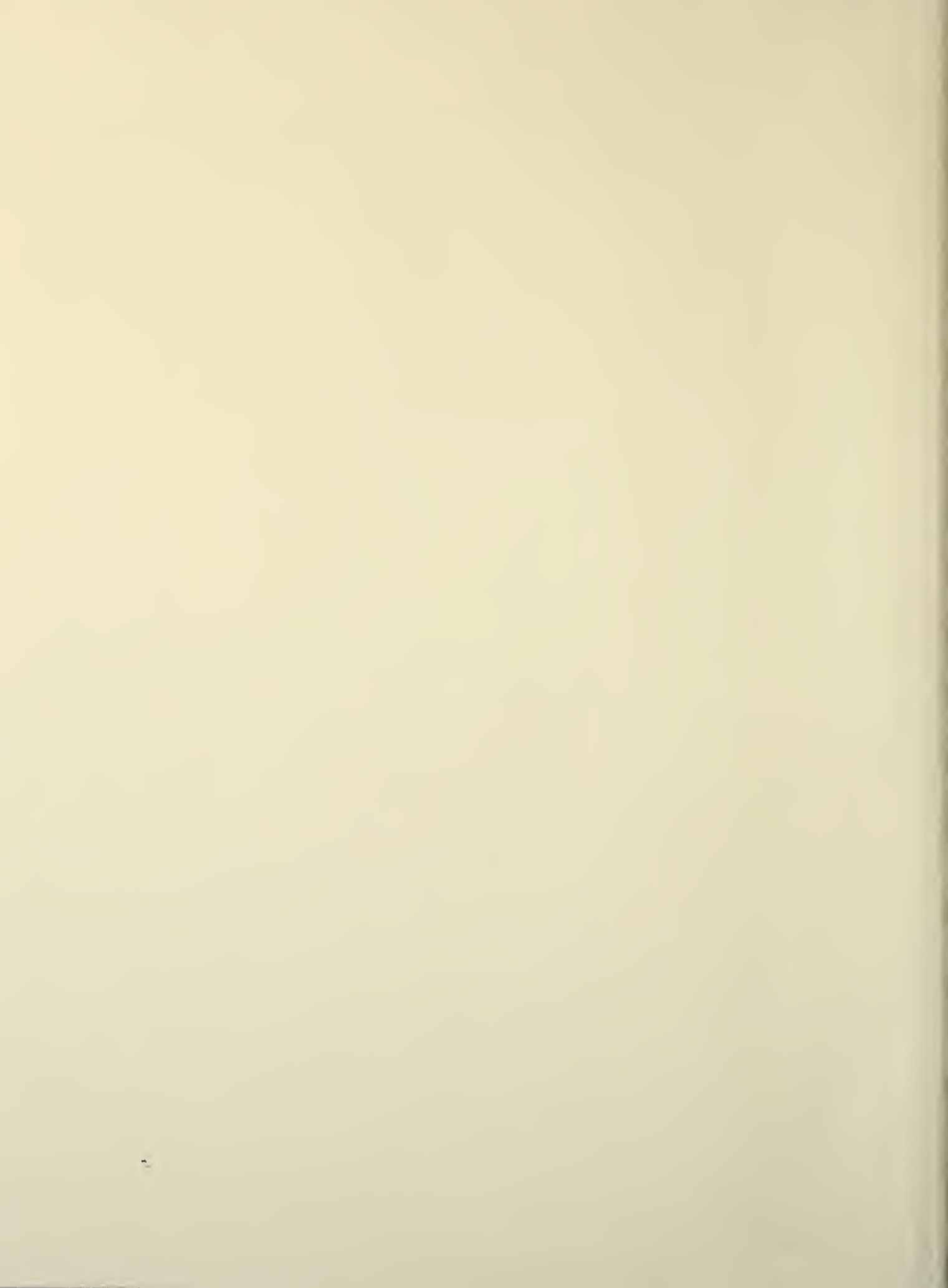
My father was a contractor to start with, and I had done private contracting for years before I worked for the City of Tacoma. So, I had met a payroll. I knew something about it.

DR. CRAWFORD: Thank you very much, Mr. Evans.

MR. EVANS: Your're very welcome.







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